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TITLE: MANUFACTURE OF FERROELECTRIC THIN FILM

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ABSTRACT:

PURPOSE: To form a thin film of good crystalline ferroelectric free of pin holes with a well-controlled composition on a device on a silicon substrate (by producing microwave plasma through electron resonance to create active oxygen species for depositing ferroelectric material.)

CONSTITUTION: Vapor from a vapor source 1 composed of Pb-La-Zr-Ti alloy is supplied to form a thin film of Pb<SB>0.92</SB>La<SB>0.03</SB>Zr<SB>0.65</SB>Ti<SB>0.35</SB>O<SB on a platinum substrate 2. While oxygen gas is supplied through a pipe 6, microwaves are introduced from a 2.45GHz source 4 into a 875 gauss field

produced by a magnetic field generator 5. As a result, plasma is produced by a
cyclotron resonance of electrons to create active oxygen species. The species
are emitted to the platinum substrate 2, heated to about 500°C, and thus
the thin film is provided. The active oxygen species may be replaced by ozone
at 10cm<SP>2</SP>/min, atomic oxygen at 5cm<SP>2</SP>/min, or N<SB>2</SB>O at
10cm<SP>2</SP>/min.